

are about a dozen complete sets now in existence, either in private or government possession. In the preface of the "Enumeratio Plantarum in Japonia sponte crescentium" by Franchet and Savatier, an account of the work is given at some length on pp. vi and vii.

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K. MEIYABE.

Humblebees and Petunias.

In the October number of the BOTANICAL GAZETTE I noticed a note from Mr. Schneck, stating the manner in which the humblebees extract the honey from the flowers of *Physostegia Virginiana*, by making a slit in the base of the corolla. Following is a similar case: During last summer I noticed that the humblebees never attempted to enter the tubes of the common garden *Petunia*, but alighted on the upper side of the corolla, made a slit in its wall near the calyx and inserted their proboscis to extract the honey. The slits were about one-third of an inch long and were made by the bee pressing his mandibles against the corolla, and so forcing apart the tissue, which tears easily in a longitudinal direction. I have not yet noticed whether the flowers so mutilated are after all fertilized by other smaller insects entering the tube. GILBERT VAN INGEN.

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CURRENT LITERATURE

Analytical Key to West Coast Botany, containing descriptions of 1,600 species of flowering plants growing west of the Sierra Nevada and Cascade crests, from San Diego to Puget Sound. By Volney Rattan. 12mo. 128 pp. A. L. Bancroft & Co., San Francisco, 1887.

The author is already known by his "Popular California Flora," and this is a continuation of the effort to bring the botany of the west coast within the reach of the schools. This "Analytical Key" is preliminary to a *West Coast Botany* for beginners, which is promised within three years. Umbelliferæ and Compositæ are omitted, and the more difficult monocotyledonous orders, but the names of the other species are placed within easy reach of beginners. This kind of work is very helpful to botanical science in general, and we expect it to result in a greater array of botanists than ever from the west coast.

Die natürlichen Pflanzenfamilien, by A. Engler and K. Prantl. Part I. Leipzig: Wilhelm Engelmann, 1887.

This is the beginning of a very extensive and important work, and the names of its editors assure botanists that it will be well done. It is intended to give an account of all the natural orders of plants, including their genera and principal species, and is fully and handsomely illustrated. Each order is to be monographed by a specialist, and thus the work will not only be of a high order, but probably completed within a reasonable time. This first part is devoted to palms, by O. Drude, and contains a full account of their distribution (geological as well as geographical), economic value, and structure, both vegetative and reproductive. Botanists will watch the progress of this work with great interest.

Manipulations de Botanique, guide pour les travaux d'histologie végétale, par Paul Girod. 72 pp., 20 plates. Paris, 1887.

This is one of the many books of to-day useful as laboratory guides. The first part briefly describes microscopic appliances and methods of using them. Then follow such subjects as "dicotyledonous stems," "monocotyledonous stems," "dicotyledonous roots," etc., all the way to algæ. Brief directions with each plant taken up, and a plate on the opposite page containing careful drawings of all the sections, clear troubles from the path of the student as completely as any laboratory guide we have ever seen. While by no means complete or explicit enough to serve the whole purpose of a laboratory guide in histological botany, it will be very useful to the advanced student as a book of reference, and in suggesting different lines of work.

Die fossilen Hölzer West Indiens, von J. Felix. Cassel, 1883.

This work, which has but recently been received in this country, is another one of the many valuable contributions of Dr. Felix to the interesting and difficult study of the internal structure of fossil wood. This department of paleobotany, which may be said to have had its origin in the year 1830, when Witham published his first observations, has, during the past few years, attained a remarkable activity in Europe, and particularly in Germany.

Several of the West Indian islands, and particularly the island of Antigua, have long been noted for their deposits of fossil wood, and many specimens had found their way into European museums from this locality. These specimens, through the kindness of the various curators, were placed at the disposal of Dr. Felix, and the results of their study is the present monograph.

Before proceeding to the detailed description of the species he remarks somewhat at length upon the difficulty attending the study of monocotyledonous and dicotyledonous wood as compared with that of coniferous. In the latter there are but three elements to be considered: "Tracheiden, Strang und Strahlen-Parenchyma," while in the former the tissues are numerous and complex, consisting of parenchyma, annular, spiral and scalariform vessels, wood cells, bast-fibres, etc. As the result of his personal examination of over four hundred living species, belonging to various families, the author concludes that a study of the histological structure alone is not in general sufficient for the identification of genera or species, since, as he says, different species of the same genus may differ so extraordinarily in their structure that, should one have them before him only in a fossil state, they would never be referred to the same genus. Again, species of different genera may so much resemble each other that, if known only in a condition of fossilization, they would undoubtedly be referred to the same genus; for example, *Sophora Japonica*, *Robinia hispida* and *Gleditschia triacanthos*; also different gen-

era in the same family may differ from each other in a very marked degree, as do the genera *Amorpha*, *Sophora* and *Erythrina* in the Leguminosæ. But, notwithstanding the difficulties in the way of specific or generic determination, the family can probably in all cases be recognized. The genera of fossil plants founded upon histological data must then be comprehensive. *Salicinium*, for instance, will include *Populus* as well as *Salix*.—F. H. KNOWLTON.

Handbook of Practical Botany. By E. Strasburger, Professor of Botany in the University of Bonn; edited from the German by W. Hillhouse, M. A., F. L. S., Professor of Botany, Mason Science College, etc. 8°. pp. xxiv, 425. London: Swan Sonnenschein, Lowrey & Co. 1887.

This book adds another admirable help to the study of plant anatomy in the laboratory. Teachers everywhere hailed with delight the appearance of the *Botanisches Practicum* of Strasburger, and, shortly after, of its abridgement, *Das Kleine botanische Practicum*. The translation and careful editing of the latter now puts a most excellent manual into the hands of English and American students—for it must be confessed (though with somewhat of shame) that most American college students can not use a German book with any profit. Most of our readers already know the arrangement and excellence of the book from the German edition. "The manual is divided into thirty-two chapters, each of which is intended to provide material for several hours' practical work in the laboratory. The earlier chapters are easy, and the difficulties to be encountered increase almost constantly up to the last chapter." To each chapter the editor has prefixed a list of materials necessary, and regrets that he did not also list the reagents to be used. Both are excellent ideas. The enlarged appendices, containing lists of reagents and notes on their preparation and use, are very valuable. Throughout the work the editor has interpolated phrases and paragraphs which serve to make clearer the author's meaning and supplement the study which he directs. The additional illustrations which are given are the ubiquitous ones from Sachs, DeBary and Prantl, which, though good, do not compare favorably with the fresh and beautifully executed originals of the *Practicum*.

As to translation, the work is perhaps as well done as usual, though it must be said that the English is not "the King's English." It is plain, however, that this is attributable to the influence of the German upon the translator. It is hardly possible for a man to translate from the German directly into good English, unless he be an exceptional scholar. One must either be content to write out the literal translation, lay it aside for several months and then reduce it to readable English, or let some one else correct the manuscript. Such sentences as these are not uncommon: "So much drawing ability as is necessary for this he may indeed possess, or can however readily obtain by practice the necessary facility." "So much water is also poured into the plate till the bell-shade has its lower edge quite immersed in it." Nor do we like some of the terms the editor

has adopted; such, for instance, as *fibro-vascular* for vascular or fibro-vascular. Was it an accident that all reference to the fact that this is a translation of "Das *Kleine* botanische Practicum," and not of "Das botanische Practicum," was omitted?

But aside from whatever slight faults the translation has—and what book is free from them?—the fact is that this work is certain to prove highly helpful to botanical students, especially to "those who, without desiring to become professional botanists, wish nevertheless to become acquainted with the elements of scientific structural botany." May their tribe increase! As our American colleges run, this will be an excellent book to put into the hands of a student who has completed the "Handbook of Plant Dissection." Finally the book is admirably manufactured. The limber binding, all but unobtainable in this country, is delightful.

The Principles of Pharmacognosy, an introduction to the study of the crude substances of the vegetable kingdom, by Friedrich A. Flückiger, Ph. S., M. D., Professor in the University of Strasburg, and Alexander Tschirch, Ph. D., Lecturer on Botany and Pharmacognosy in the University of Berlin. Translated from the second and completely revised German edition by Frederick B. Power, Ph. D., Professor of Materia Medica and Pharmacy in the University of Wisconsin. New York: William Wood & Co., 1887. 8vo. pp. xvi, 294, with 186 figures.

In presenting to American students a translation of a standard German work by authors of eminence in their department of applied science, Professor Power, a botanist of no small attainments, as well as an accomplished chemist, has rendered a considerable service to botanists. Aside from its value as a pharmaceutical handbook, this little volume, with its copious and accurate illustrations, is an admirable treatise on elementary vegetable histology, based essentially on Haberlandt's *Physiologische Pflanzenanatomie*. The work of the translator is well done; the type and wood cuts are excellent. The book should find a place in every botanical laboratory.—W. T.

Contributions to American Botany, XV. By Asa Gray. From Proc. Amer. Acad., xxii. pp. 270-314.

This contribution is largely concerned with a revision of certain polypetalous genera and orders precursory to this part of the Synoptical Flora. In Papaveraceæ three tribes are proposed, *viz.*, Platystemoneæ, Papavereæ, and Hunnemanniæ, and a revision of *Eschscholtzia* (nine species) is given. A new generic key is proposed for Portulacaceæ, and notes on all the genera with a revision of *Claytonia*, with twenty-one species, are given. In the consideration of the Malvaceæ the tribe Malveæ has its sub-tribes reduced to two, allowing *Sida* to include all the genera with capitate stigmas. A tentative arrangement is proposed for the perennial species of *Sidalcea*. The very closely related genera *Malvastrum* and *Sphæralcea* are still kept up, but with a new distribution of species. All those species are retained in *Malvastrum* in which there is no empty

terminal portion in the carpel, but the cell conforms to the solitary ovule and seed. This gives a Malvastriform section to Sphæralcea, and in our Rocky Mt. species, for example, Malvastrum coccineum retains its place, while Malvastrum Munroanum becomes Sphæralcea Munroana. *Horsfordia* is a new genus, between Sphæralcea and Abutilon, of two species. *H. alata* is *Sida alata* of Watson, and *H. Newberryi* is *Abutilon Newberryi* of Bot. Calif. A new order, CHEIRANTHODENDREÆ, is established, containing the genera Cheiranthodendron and Fremontia. Bentham first placed these genera in Malvaceæ, but later transferred them to Sterculiaceæ. Dr. Gray thinks it better to recognize the peculiarities of these genera, of which the leading one is the strongly quincuncial calyx, and not to force them into an order of which a valvate calyx is an essential and substantially an unvaried character. New species of Mr. Pringle's collecting are also described in addition to these under the heading "Miscellanea."

Outlines of Classification and Special Morphology of Plants. By Dr. K. Goebel. Translated by Henry E. F. Garnsey, and revised by I. B. Balfour. Oxford: Clarendon Press, 1887. pp. xii, 515.

The original of this new edition of Sachs's "Text-book of Botany," Book II, has been in the possession of botanists since 1882, but this most helpful translation puts it within the reach of all English speaking botanists. There has been considerable delay in its publication, as the reviser's preface is dated 1885, but it is none the less welcome. The chief thought of the book seems to be to "make use of a consistent terminology based upon homology," a thing of great educational value, although there are some who may think it is not the best plan. For example, to call a pollen-grain a microspore may seem to be doing violence to a long established name, but when it is understood that the microspores of Phanerogams are called pollen-grains, there can be no objection to using the latter name as a special group-name, and at the same time retain the idea of homology. Objections of this kind are chiefly raised in the new terminology of Phanerogams, but the clear way in which this is stated, at the same time acknowledging the old names, can not be too highly commended. In fact, the whole treatment of Phanerogams is masterly, and is probably the most valuable contribution in the book, and should be carefully studied by every student of botany. The changes in the grouping of plants are known from the original German text, but it may be well to note them here. Four great groups are recognized, viz., THALLOPHYTES, MUSCINEÆ, VASCULAR CRYPTOGAMS, and SEED-PLANTS or PHANEROGAMS. It would seem more uniform to call the three last groups Bryophytes, Pteridophytes and Spermaphytes. Under Thallophytes five equivalent groups are recognized, which involves the greatest change from the original grouping as given by Sachs. *Myxomycetes* and *Diatomaceæ* are set apart as the first two groups, to which no serious objection will be made, unless

that it seems somewhat unnatural to separate diatoms and desmids so widely. The third group contains *Schizophyta*, while the fourth and fifth are *Algæ* and *Fungi*. The last two groups seem to show the widest departure from the original presentation of these plants. The teaching that the presence or absence of chlorophyll makes no special difference in the presence of morphological resemblances has been widely taught. However, the present use of these terms has not been absolutely restricted by the former distinction between algæ and fungi, and so morphological resemblance has not been slighted. The group *Algæ* is made to contain three sub-divisions, viz., *Chlorophyceæ*, *Phæophyceæ*, and *Rhodophyceæ*, or green, brown, and red seaweeds. *Fungi* contains six sub-divisions, viz., *Chytridæ*, *Ustilagineæ*, *Phycomycetes*, *Ascomycetes*, *Uredineæ*, and *Basidiomycetes*. The second great group, MUSCINEÆ, comprises *Hepaticæ* and *Musci*. The third group, VASCULAR CRYPTOGAMS, contains *Filicineæ*, *Equisetineæ*, *Sphenophylleæ* (a fossil group), and *Lycopodineæ*. The grouping of SEED PLANTS is that which has been long familiar to botanists. Not the least valuable part of the book is the appended "Explanation of terms." Altogether, this work is the most valuable recent contribution in the English language to the classification and morphology of plants.

NOTES AND NEWS.

PROF. AND MRS C. S. SARGENT have gone to Mexico, via Key West and Galveston.

DR. ASA GRAY and wife sailed for Europe April 7. The Doctor goes chiefly to visit the Lamarck herbarium.

DR. C. S. SARGENT reports that 70,000 trees and shrubs have been planted at the Arnold Arboretum during the last year.

COOKE'S HANDBOOK of British Fungi, 2d edition, being issued as a supplement to *Grevillea*, has now reached page 192, and species 709 in the genus *Agaricus*.

DR. GRAY'S new book, to take the place of "How plants grow" and the "Lessons," which have done such yeoman service, is about ready for the press.

A. P. MORGAN gives descriptions and an analytical key to the species, twenty-four in number, of the North American Amanitas of the genus *Agaricus*, in the March *Journal of Mycology*.

THE *Gardener's Monthly* says that Dr. Rothrock has been compelled to take a year's vacation on account of his health. He will go south, spending the summer among the mountains.

THE WILMINGTON FLORA, by Thomas F. Wood and Gerald McCarthy, already noticed in this journal, has been distributed separately as a reprint from the *Journal of the Elisha Mitchell Scientific Society of N. Carolina*.

THOMAS HOWELL, of Arthur, Oregon, has just distributed a catalogue of the Phanerogams and Pteridophytes of Oregon, Washington, and Idaho. Mr. Howell is a well-known collector, and his catalogue is thoroughly reliable.